



Science Arts & Métiers (SAM)

is an open access repository that collects the work of Arts et Métiers Institute of Technology researchers and makes it freely available over the web where possible.

This is an author-deposited version published in: <https://sam.ensam.eu>
Handle ID: <http://hdl.handle.net/10985/9765>

To cite this version :

Jayesh S. PILLAI, Simon RICHIR, Colin SCHMIDT - Aesthetiography : The next Milestone in the Confluence of Media - In: 18th International conference of the society for philosophy and technology. Technology in the age of Information (SPT), Portugal, 2013-07-04 - Technology in the Age of Information, 18th International conference of the Society for Philosophy and Technology - 2013

Any correspondence concerning this service should be sent to the repository

Administrator : scienceouverte@ensam.eu



Aesthetiography: The Next Milestone in the Confluence of Media

Jayesh S. Pillai ^{a,*}, Simon Richir ^a, Colin Schmidt ^{a, b}

^a LAMPA, Arts et Metiers ParisTech, Angers, France

^b Le Mans University, Le Mans, France

*Corresponding author:

Address: LAMPA, Arts et Metiers ParisTech, 2 bd du Ronceray BP 93525, 49035 Angers, France

Tel/Fax: +33 243670576

E-mail address: jayesh.pillai@ensam.eu, jayesh.spillai@gmail.com

Full paper for the 18th International Conference of the Society for Philosophy and Technology, Lisbon, (SPT 2013), Technology in the Age of Information.

ABSTRACT

Art and technology always evolved simultaneously, often inspiring and complimenting each other. This can be observed at every point in the history of media technologies. We suggest that the evolution of media has always been looking forward to an ultimate form of representation of reality that one could experience - a perfect Simulated Reality. Over the years the forms of media have been evolving and improving in order to create stronger perceptual as well as psychological illusions. Today virtual reality and associated technologies help evoke illusion of reality strong enough to make one believe to be entirely immersed and present in an artificial world. Observing these developments, we believe that the distinct goal of tomorrow's media would be to create a perfect experience of perceptual illusion with the help of multisensory mediation. In this pursuit of an ultimate representational media, different media technologies will converge. This meeting point of cinema, virtual reality and associated new-media technologies in the near future, is what we would like to refer to as 'Aesthetiography' - the art and science of capturing (or creating) and reproducing an absolute perceptual experience. We propose that it would be the next milestone in the confluence of media.

Keywords: Virtual Reality, New Media, Experience Sharing, Information and aesthetics, Technological convergences

1. INTRODUCTION

"If the new goal of film was to create a convincing illusion of reality, then why not toss tradition to the winds? Why not say goodbye to the rectangular picture frame, two-dimensional images, horizontal audiences, and the limited senses of sight and hearing, and reach out for everything and anything that would enhance the illusion of reality?"

- Heilig (1998, pp.343-344)

Let's observe the evolution of cinema. When the 'motion picture' was born, it was a sensation as it gave the prevalent media of photography a new dimension - time. The exhilaration was of recording images in a sequence that made us able to present a part of an event in time, unlike

still photography or paintings. Although initial black and white movies were silent, they were usually accompanied with live musical performances that gave an additional sense of ambience. The cinema then became the 'talkies', with the development of electronic sound recording technologies that further simplified the addition of a new perceptual dimension - sound, making silent movies obsolete. Gradually colour movies took over and cinema has been evolving since, both in terms of artistic styles and technological improvements. Introduction to stereo recording and projection technologies helped give cinema (popularly known as 3D movies) the spatial dimension of depth perception. In the recent past, the visual resolution took a leap, with the development of recording formats like IMAX and exceptionally high definition cameras. Digital recording and projection systems have revolutionized cinema experience in the last few decades. As cinema evolved, so did related interactive audio-visual media like video games, flight simulators and virtual reality systems, introducing non-linear narratives and real-time computer generated worlds. Notably, Sensorama by [Morton Heilig \(1962\)](#) is one among the first virtual reality systems to attempt multisensory simulated experience. Today's advanced virtual reality systems help immerse ourselves into artificial environments, and are striving to evoke even stronger 'sense of presence'. Thus, in light of this endless quest for an ultimate experience, one cannot help but wonder where these representational media will take us.

2. MEDIA - EVOKED REALITY

2.1. Sense of Presence (Evoked Presence)

Our experience of being present in a media generated reality is often referred to as the 'sense of presence'. Research on this sense of presence in virtual reality, teleoperators and media technologies has gathered much attention in the last few decades. According to [Steuer \(1992\)](#), the concept of presence is the key to defining virtual reality in terms of human experience rather than technological hardware. Presence refers not to one's surroundings as they exist in the physical world, but to the perception of those surroundings as mediated by both automatic and controlled mental processes.

Early interest in the field of presence can be traced back to the study of 'telepresence' ([Minsky, 1980](#)) in the field of artificial intelligence and human-machine interaction in teleoperation. In fact the concept of 'Being There' was introduced by [Reeves \(1991\)](#) to describe how viewers experience the environment they encounter on television, borrowing the idea from the 1970 novel 'Being There' ([Kozinski, 1970](#)) and the 1979 movie of the same name. [Johnsen and Corliss \(1971\)](#) also discussed the importance of designing displays and controls that will 'help the operator project his presence' into a remote work space ([Draper et al., 1998](#); [Ijsselstein et al., 2000](#)). In fact some argue that the pursuit of telepresence has been part of the evolution of all media ([Biocca et al., 1995](#); [Kim and Biocca, 1997](#)) and that a theory of telepresence should apply to all mediated environments ([Steuer, 1995](#); [Lombard and Ditton, 1997](#)). We refer to this mediated sense of presence as '*Evoked Presence*' ([Pillai et al., 2013](#)).

2.2. Illusion of Reality (Evoked Reality)

'Reality' is a collective experience of space and time, forming the source of our 'presence'. Thus, it is when there is a spatio-temporal 'illusion of reality', that we experience an evoked 'sense of

presence'. When we experience any form of media, the illusion of reality is what evokes the sense of presence. Immersive virtual reality systems can create strong and convincing illusions of reality in the minds of users, that they feel present in it even to the extent that they behave as if experiencing the real world (Blascovich et al., 2002; Bailenson et al., 2006; Slater, 2009; Slater et al., 2009). If we examine the various determinants and components of the sense of presence, we can summarise them into two broad categories (1) Perceptual Illusion: the perception of a continuous stream of sensory input, and (2) Psychological Illusion: the continuous cognitive processes with respect to the perceptual input, responding similar to how the mind would have reacted in the real world. The combined spatio-temporal illusion of reality that we evoke through different means in order to enable the experience of presence is what is called 'Evoked Reality' (ER) (Pillai et al., 2013).

2.3. Types of Reality

Before we move further, we must first identify with few terms and concepts associated with Evoked Reality. What we normally refer to as the 'real world' or the 'experience of the physical world' will be referred to as - 'Primary Reality'. And so, the 'illusion of reality' that is evoked with or without the help of an external medium will be referred to as - 'Evoked Reality'. Evoked Reality is an illusion of reality, different from our Primary Reality. Together they constitute our overall experience of reality (Figure 1).

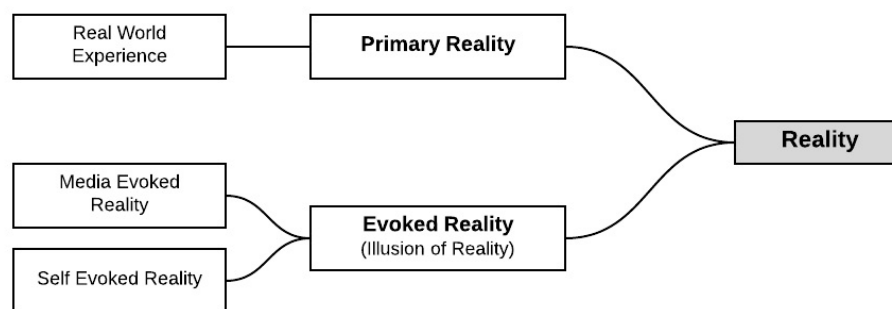


Figure 1: Reality Classification - Primary Reality and Evoked Reality [source: Pillai, 2013]

It has also been suggested that our contact with the real world itself may perhaps be considered as mediated. Loomis (1992) pointed out that the mediation of virtual environments and the study on virtual reality experiences lead us to reconsider how our body mediates our mental construction of the real world. To this Biocca (1997) added that we have been present in this environment for so long and it is so natural, that the idea that presence might be a psychological construct is only raised by philosophers and perceptual psychologists. In fact there are researchers who consider calling the real world experience as 'first order mediation' (ISPR - International Society for Presence Research, 2000). Thus it is to be objective as well that we refer to it as our Primary Reality.

"Primary Reality refers to the reality of our Real World. In Primary Reality, the experience evoking stimulation arrives at our sensory organs directly from objects from the real world. We maintain this as an ideal case in which the stimulus corresponds to the actual

object and does not deceive or misinform us. [. . .] We could say that it's this Primary Reality that we rely on for our everyday activities. It's the reality in which we believe that we live in. Our experiences in this Primary Reality may form the basis for our experiences and expectations in an ER. For example, our understanding of the real world could shape how we experience presence in an immersive virtual reality environment, or even in a dream. We could suppose that it's the Primary Reality in which one believes this paper exists, or is being read." - Pillai et al. (2013)

2.4. Types of Evoked Reality

As we can see in the figure above, Evoked reality can be classified into two: *Media-Evoked* and *Self-Evoked*. Simply put, the illusion of reality evoked through media is referred to as '*Media-Evoked Reality*' or Media-ER, whereas the illusion of reality evoked endogenously, without the help of an external medium is referred to as '*Self-Evoked Reality*' or Self-ER (implying that the reality evoked is initiated internally by the mind itself).

The '*three poles of reality*' was defined by Pillai et al. (2013) from the perspective of Self-Evoked and Media-Evoked Reality (**Figure 2**). According to them it's the shifts in the type of reality evoked that create respective shifts in the level of presence evoked. If one experiences a highly convincing Evoked Reality through a simulation media, he/she would experience an equivalently strong Evoked Presence.

The 3 Poles of reality are:

- Dream Reality (Threshold of Self-ER)
- Primary Reality (No ER)
- Simulated Reality (Threshold of Media-ER)

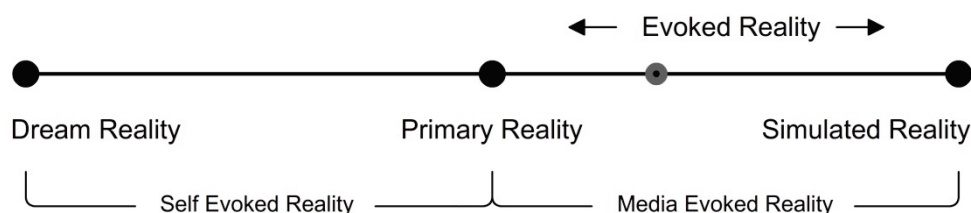


Figure 2: Three Poles of Reality: Evoked Reality constantly shifts between them [source: Pillai et al., 2013]

'Mediation' in the Media-ER context denotes a reasonably uninterrupted source of external perceptual input from the Primary Reality. The sensory stimuli should be illusive enough to represent an object (whether known or unknown, whether abstract or detail) which is in fact not there in the Primary Reality. It would also mean that at least one of our senses should be affected by the deceiving sensory stimuli. The mediation should be continuous, especially in order to sustain Media-ER for higher amount of time without breaking the spell. Whereas 'Self-Evoked' denotes that the reality experienced is generated within. Both perceptual and psychological illusions are endogenously evoked in the mind, without the help of an external mediation or perceptual input. We must note that in this paper we are concerned principally with Media-Evoked reality.

2.5. Media-Evoked Reality

As a step towards measuring presence evoked by media, in a study by [Kim \(1996\)](#), subjects (after watching television) were asked to report how often they had had the following perceptions: 'I felt I was in the world the television created', 'the television-generated world seemed to me to be more like somewhere that I visited rather than something that I saw', and 'my body was in this room, but my mind was inside the world created by the television' ([Lombard and Ditton, 1997](#)). In a focus group study designed to investigate viewers' experiences of stereoscopic television, [Freeman and Avons \(2000\)](#) found that observers used terms commonly associated with virtual environment display systems, such as 'being there'. [Lessiter et al. \(2001\)](#) proposed that presence may be evoked by a range of media to varying degrees. They suggested that displays that support a high degree of photorealism may compensate for an absence of control and interactivity typically supported in virtual reality environments.

According to [Gerrig \(1993\)](#), a reader of a book can be phenomenally transported to the narrative environment created by the medium. Gerrig's theory of 'being transported' included the following propositions: (1) Someone is transported (the reader becomes the traveller) (2) by some means of transportation (medium) (3) as a result of performing certain actions (effect of mediation). (4) The traveller goes some distance from his or her environment of origin (conscious experience of an Evoked Reality) (5) that makes some aspects of the environment of origin inaccessible (low accessibility to Primary Reality). (3) The traveller returns to the environment of origin, somewhat changed by the journey (Return to the Primary Reality) ([Gerrig, 1993, pp.10-11](#)). With respect to Gerrig's view, [Kim \(1996\)](#) had identified two factors of presence as 'departure' and 'arrival'. Furthermore, [Kim and Biocca \(1997\)](#) compared Gerrig's theory of 'being transported' to the concept of telepresence, as they describe the same psychological phenomenon. In fact, the users of today's mass media, such as books, newspapers, magazine, and television can feel present in the remote or artificial environment created by the mediated information ([Kim and Biocca, 1997](#)).

"The blocking of sensory impressions from physical reality is a crucial part of the most compelling VR experiences. The senses are immersed in the virtual world; the body is entrusted to a reality engine. The eyes are covered by a head-mounted display; the real world is invisible. The ears are covered by headphones; ambient sound is muffled. The hands are covered by gloves or props: "touch only the virtual bodies." Virtual reality may share common elements with reading a book in a quiet corner, but this book has stretched in all directions and wrapped itself around the senses of the reader - the reader is swallowed by the story." - [Biocca and Levy \(1995, p.135\)](#)

In the case of excellent virtual reality systems, the perceptual illusion is exceptionally strong leading to stronger psychological illusion. It is clear that in a Media-ER, we experience a sense of presence. Media-ER is primarily affected by our external perception. The perceptual illusion that they evoke depends of various factors, like perceptual frame and field of vision ([Hatada and Sakata, 1980](#); [Milgram et al., 1994](#); [Hendrix and Barfield, 1996](#)), quality of visual realism ([Bishop, 1994](#); [Christou and Parker, 1995](#); [Vinayagamoorthy et al., 2004](#); [Slater et al., 2009](#)), or interactivity and multisensory immersion with media updating and feedback ([Heilig, 1962](#); [Krueger, 1985](#); [Biocca, 1997](#); [Biocca et al., 2002](#); [Bruder et al., 2009](#); [Astrinaki, 2012](#)). Although

the psychological illusion is evoked with respect to the perceptual illusion, it is largely affected by the conceptual part of the media, like the context of the mediation (Mantovani and Riva, 1999; Biocca, 2002; Grau, 2004; Waterworth and Waterworth, 2006), contents of the scenario represented (Usoh et al., 1999; Ijsselsteijn, 2003), voluntary or involuntary suspension of disbelief (Steuer, 1992; Slater and Usoh, 1993) or emotional and social attributes (Bailenson et al., 2006; Ravaja et al., 2006; Llobera et al., 2010; Geslin et al., 2011; Richir et al., 2011).

3. EVOLUTION OF MEDIA

The urge to evoke reality different from our Primary Reality (real world reality) is not at all new (Pillai et al., 2013) and can be observed through the evolution of artistic and scientific media throughout history (Biocca and Levy, 1995; Blascovich et al., 2002; Biocca, 2003; Grau, 2004). According to Blascovich and Bailenson (2011), we travel virtually via media all the time and throughout human history we have been using media to wander into and explore virtual worlds. Biocca et al. (1995) pointed out that 'virtual reality' is a heterogeneous cluster of simulator technologies that has been slowly diffusing for decades. They noted that there is in fact no particular starting point, but virtual reality has been a part of the grand evolution of media technology towards the achievement of the ancient desire for 'physical transcendence' and to escape from the confines of the physical world.

3.1. From Caves to CAVEs

"When anything new comes along, everyone, like a child discovering the world, thinks that they've invented it, but you scratch a little and you find a caveman scratching on a wall is creating virtual reality in a sense. What is new here is that more sophisticated instruments give you the power to do it more easily. Virtual Reality is dreams."

- Morton Heilig [as quoted in (Hamit, 1993, p.57)]

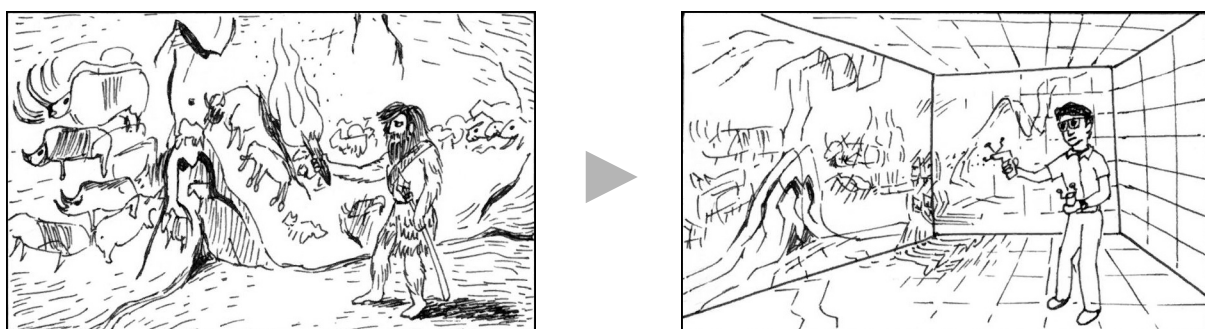


Figure 3: From caveman to CAVE-man [source: Pillai, 2013]

The cave paintings (with representations of elements from reality) that date back to prehistoric times may be considered as one of the earliest forms of media. We could argue, for instance the paintings at Chauvet caves to be one of such earliest known attempts that eventually paved the way for today's extremely immersive Cave Automatic Virtual environments - CAVEs (Figure 3) [see Cruz-Neira et al. (1993) for CAVE systems]. As technology progressed media evolved as well (Figure 4) and presently we are on the verge of extreme possibilities in mediation, thus equivalent Media-Evoked Presence (Pillai et al., 2013).

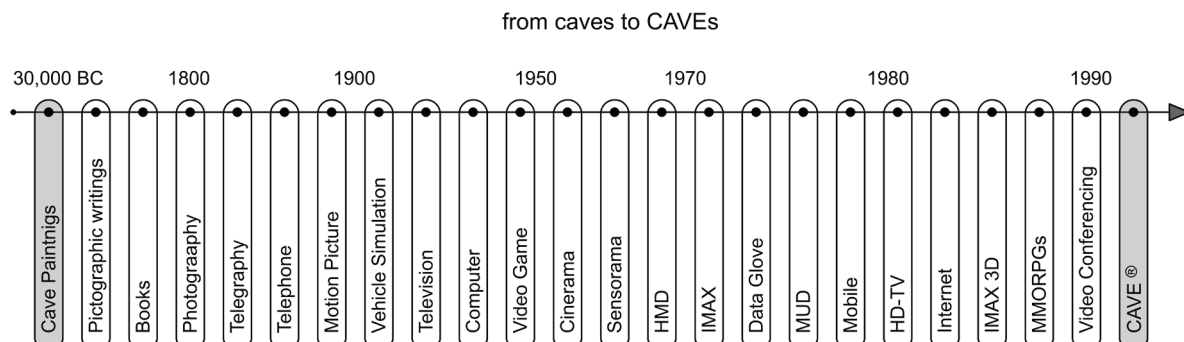
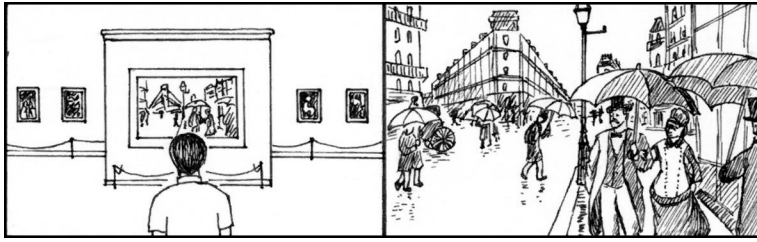


Figure 4: From caves to CAVEs - Evolution of media [source: Pillai et al., 2013]

It is human nature to find different means to escape from our everyday reality. In fact it has always been a principle driving force in the evolution of media (Biocca et al., 1995). With the help of different media we have already succeeded to evoke a sense of presence in virtual environments and we further aim for an optimum level - almost similar to our real world. Every form of media evokes Evoked Reality of different *qualia* of and hence different degrees of Evoked Presence. However, as rightly noted by Ijsselstein (2003) the basic appeal of media still lies in the content, the storyline, the ideas and emotions that are being communicated; we can be bored in virtual reality while moved to tears by a book. This is precisely why the reality evoked by media in one's mind depends greatly on the eventual psychological illusion, although it may have been triggered by a perceptual illusion.

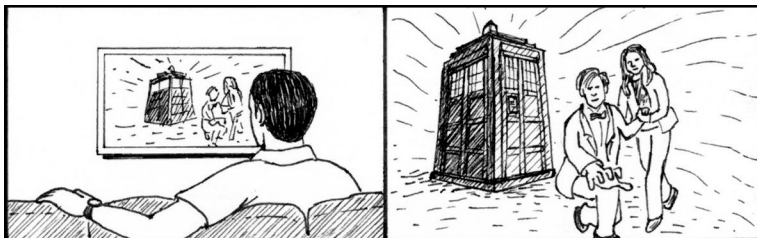
The different kinds of mediation that induce Media-ER experiences may range from visual arts and representation (simple sketches, illustrations, drawings, paintings, sculptures, prints, graphic design, photographs), literary arts and narratives (books, stories, plays, novels), radio broadcasts and narratives, telephones and mobile phones, online interactions (e-books, digital images, instant messaging, audio and video chats), television programs (live shows, reality shows, scripted reality shows, soap operas), movies and videos (2D movies, IMAX movies, 3D movies, online videos, interactive non-linear videos), performing arts (theatre, opera, magic, spoken word, dance and music, musical theatre), video games (2D, 3D, first-person, multiplayer, MMORPGs), online virtual worlds and communities, Augmented and Mixed Reality applications (mobile and iPad apps, AR projections, AR glasses), Teleoperation (telecommunication, telerobotics, remote manipulation, tangible interactions), Human-in-the-loop simulators (flight simulators, driving simulators, outer space simulators) to Virtual Reality (simple VR systems to highly immersive and multimodal interactive VR environments, beyond head-mounted displays, data gloves or CAVE systems) (Pillai, 2013). Figure 5 endeavours to visually illustrate a range of everyday Media-ER experiences, not necessarily in the order of the strength of their Evoked Presence. In each example, note that the left part illustrates an objective view while the right part attempts to represent the subjective experience of Media-ER from the user's point-of-view.



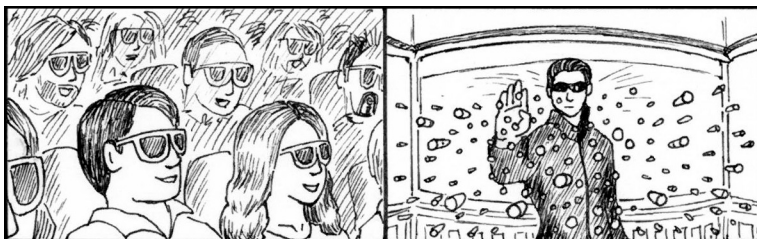
Visual arts and representation
(simple sketches, illustrations,
drawings, paintings, sculptures,
prints, graphic design,
photographs)



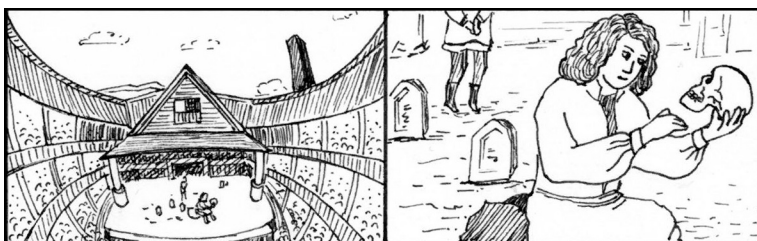
Literary arts and narratives
(books, stories, plays, novels)
Radio broadcasts and narratives,
telephones and mobile phones.



Television programs (live shows,
reality shows, scripted reality
shows, soap operas)



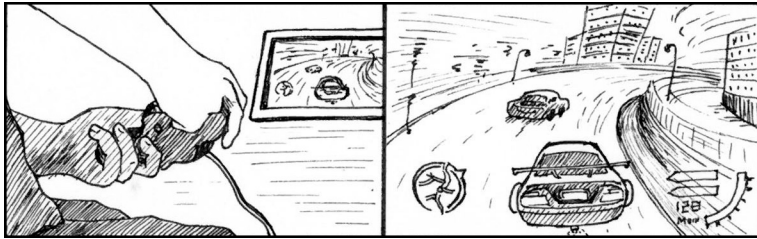
Movies and videos (2D movies,
IMAX movies, 3D movies, online
videos, interactive non-linear
videos)



Performing arts (theatre, opera,
magic, spoken word, dance and
music, musical theatre)



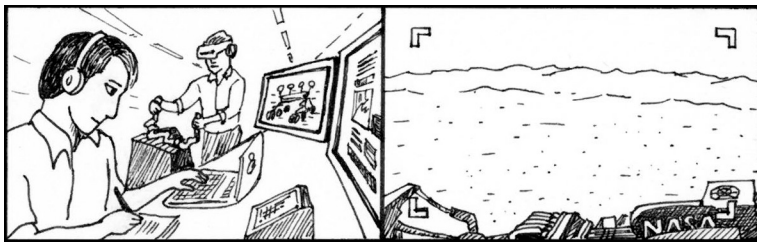
Online interactions (e-books,
digital images, instant messaging,
audio and video chats)



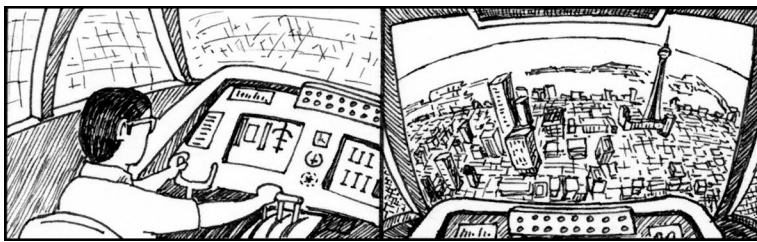
video games (2D, 3D, first-person, multiplayer, MMORPGs), online virtual worlds and communities



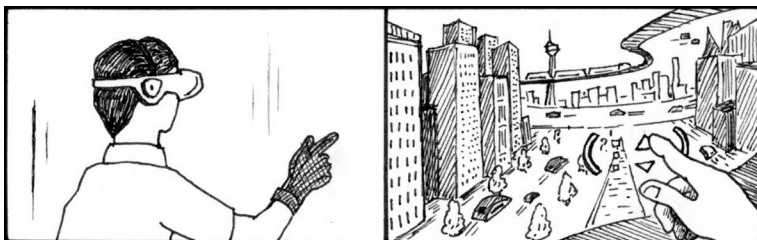
Augmented and Mixed Reality applications (mobile and iPad apps, AR projections, AR glasses)



Teleoperation
(telecommunication, telerobotics, remote manipulation, tangible interactions)



Human-in-the-loop simulators
(flight simulators, driving simulators, outer space simulators)



Virtual Reality (simple VR systems to highly immersive and multimodal interactive VR environments)

Figure 5: A range of Media-Evoked Reality experiences that induce different levels of Evoked Presence
[source: Pillai, 2013]

4. PURSUIT OF AN ULTIMATE MEDIA EXPERIENCE

"The ultimate representational system would allow the observer to interact 'naturally' with objects and other individuals within a simulated environment or 'world,' an experience indistinguishable from 'normal reality.' Although such a representational system might conceivably use direct brain stimulation in the future, it will more likely use digitally controlled displays that stimulate the human sensory organs, the natural conduits to the brain." - Loomis et al. (1999)

If we examine the history of media, we can notice that the advancements in virtual reality and interactive gaming technologies also occurred in parallel to that of cinema, and they often crossed paths at different points. Experimental systems like multi-projector Cinerama (that helped in widescreen projections) (Figure 6), Heilig's Sensorama Simulator (an excellent example of the merging of movie experience with virtual reality) (Figure 7), stereo and holographic projection technologies and head mounted displays (that track the user's head movements in order to update the viewing perspective in real-time) are few such examples. While experimental non-linear and interactive movies and videos are being inspired by video games, additional sensory immersion in virtual reality is being attempted with the help of multisensory technologies, striving for an ultimate medium of representation and experience.

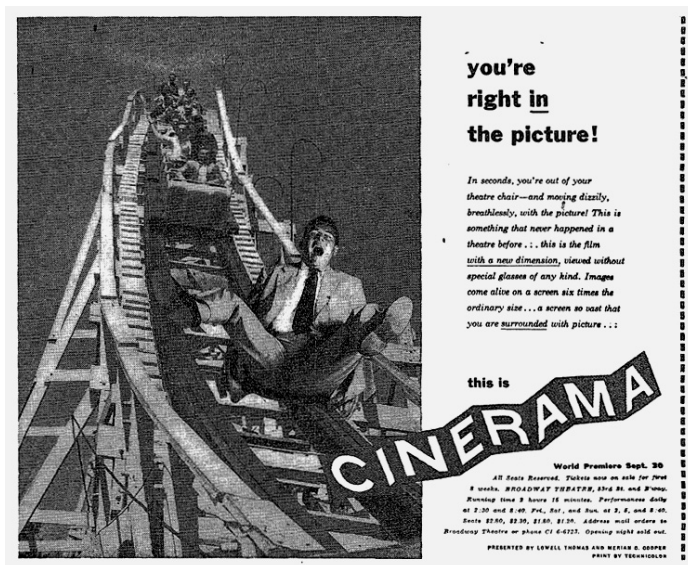


Figure 6: Advertisement for Cinerama, 1952

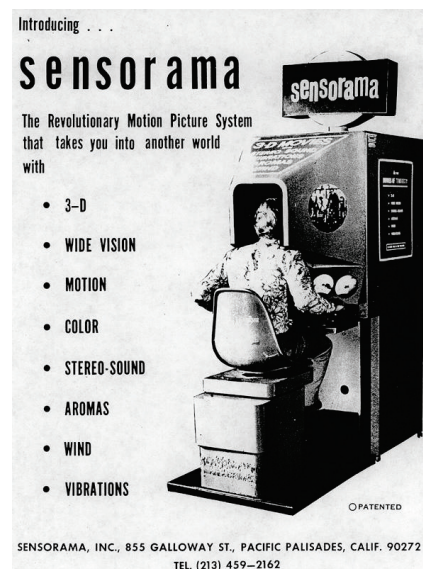


Figure 7: Advertisement for Sensorama, 1962

"The ultimate display would, of course, be a room within which the computer can control the existence of matter. A chair displayed in such a room would be good enough to sit in. Handcuffs displayed in such a room would be confining, and a bullet displayed in such a room would be fatal. With appropriate programming such a display could literally be the Wonderland into which Alice walked." - Sutherland, (1965)

The progress and evolution of media indeed suggest that the future of media experience is heading towards a perfect Simulated Reality like scenario.

4.1. Simulated Reality

"If we're going to step through the window into another world, why not go the whole way?" - Heilig (1962)

Virtual reality uses displays that would entirely mediate our visual perception in a manner that our head or eye movements are tracked and updated with appropriate images to maintain this illusion of receiving particular visual stimuli from particular objects. Similar perceptual illusions are being achieved in the case of other senses as well. A Simulated Reality would be the most compelling and plausible reality that could ever be achieved through such mediations. At the moment immersive virtual reality systems would be one among the media technologies that could create strong Evoked Reality that may be considerably close to Simulated Reality. Lombard and Ditton (1997) noted that the illusion of non-mediation does not represent a perceptual or psychological malfunction or psychosis, in which the mediated experience is consciously confused with what is non-mediated or 'real.' In fact as they noted, when it comes to present virtual reality systems, when asked, users would accurately report that they are using a medium. However, in the hypothetical condition of a perfectly Simulated Reality our mind would completely believe the reality evoked by the media and have no knowledge of the parent Primary Reality (similar to a 'brains in a vat' scenario (Putnam, 1982) or a perfect computer simulated reality (Bostrom, 2003)). In this state, it would be necessary to force a Break-in-Reality in order to bring our mind back to Primary Reality. A perfect Simulated Reality is the Media-Evoked Reality with the threshold of Evoked Presence (Pillai et al., 2013).

5. AESTHETIOGRAPHY

As discussed above, cinema, virtual reality, video games and associated media technologies that help us share experiences have been taking different but often intersecting evolutionary paths. It is clear to us that presently they are heading towards another major crossover along their paths, although with distinct concerns of their own. The art oriented fields like cinema constantly adopts the higher dimensions provided by technology, rapidly adapting to the developments, while virtual reality and gaming technologies are always looking for aesthetic and artistic solutions to enhance our experience of presence in the evoked reality. Although today this may seem farfetched, we suggest that the ultimate aim of media is the hypothetical scenario of a 'Simulated Reality', where one may not distinguish the experience from that of the real world. However at this point of time, a definite objective for these domains is to evoke a convincing illusion of experience of reality, using stronger immersion technologies that could recreate or reproduce the maximum number of perceptual sensations possible.

This meeting point of new-media technologies in the near future, is what we would like to refer to as '*Aesthetigraphy*' - the art and science of capturing (or creating) and reproducing an absolute perceptual experience (Figure 8). We derive the term Aesthetigraphy from the Greek *aisthēsis* "sensation" and *-graphein* "to write or to record". Aesthetigraphy is the media technology that would help us capture the entire essence of a perceptual experience of the real world, modify it, or even artificially synthesize it to be reproduced and experienced subsequently or in real-time. The method of experience, especially evoking powerful perceptual illusions will be perfected by virtual reality related technologies while the approach towards

evoking intense psychological illusions will be improved by cinema and connected artistic media. As we progress towards such a scenario in the passionate pursuit of an ultimate medium of experience, like many other technological innovations, Aesthetiography also may lead to serious ethical and cognitive concerns in the future, with regard to experience sharing.

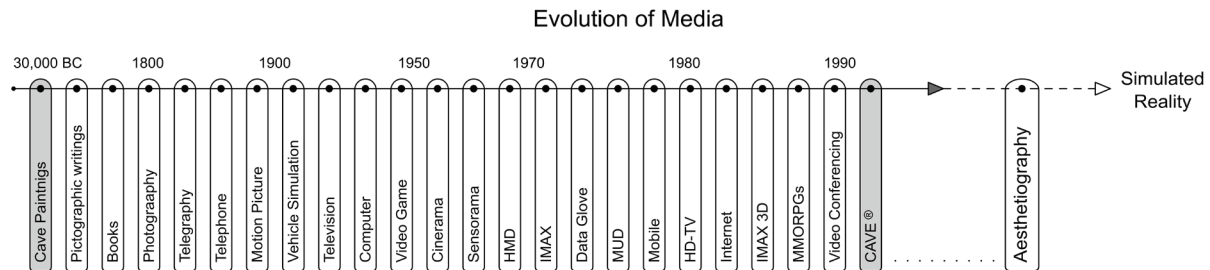


Figure 8: Aesthetiography: The next milestone in the confluence of media [proposition]

5.1. Prospects and Concerns

The subject of creating a perfect perpetual experience has been a part of virtual reality research. Highly immersive virtual reality systems use computer generated spatial imagery and audio along with multi-sensory interactions to induce compelling experiences of Evoked Presence in a virtual environment. Whereas recording an entire perceptual experience in order to recreate at a later point in time, would be more challenging. However, observing the enormous progress in the field of photography, audio engineering, videography and related technological media, one can't help but imagine the numerous possibilities of capturing of elements related to other perceptual senses, in the near future. It was not long ago, in the late nineteenth century, when the 'Cinematographe' was introduced by Léon Bouly and the Lumière brothers or the Kinetoscope by Thomas Edison. The films that were created then were considered to be the best possible forms of perceptual experience with respect to quality and resolution. But with the expansion of those original concepts, by the end of the twentieth century we have seen how drastically the visual resolution, stereoscopic technologies, audio quality or computer generated imagery progressed. Along with these developments, took place ground breaking technological innovations in the area of display techniques, transmission techniques, odour and taste experience, head-tracking devices, force-feedback interactions and immersive virtual reality systems.

Another important thing to consider when it comes to Aesthetiography is the cognitive tolerance with respect to our perceptual experience. Every person has different and subjective level of cognitive capacity or limitation with respect to media experiences. For instance, the experience of a horror movie, displayed on a simple flat television screen can be powerfully terrifying for the faint-hearted. Perhaps the threshold of this cognitive tolerance in media experience may also gradually increase, with respect to constant exposure and knowledge of different media. For instance, on the first screening of Lumiere brother's short film 'L'arrivée d'un train en gare de La Ciotat' in 1896, it is believed that the spectators were awestruck and frightened by the perspective view of the arriving train, as if moving towards them. In fact similar effects have been observed in other kinds of media too. For example, the famous radio

broadcast of 1938 that was directed and narrated by Orson Welles, as part of an anthology series. This radio drama was presented as a series of simulated news bulletins, which suggested an alien invasion by Martians. It was noted that it created a great deal of panic among many listeners. The narration was in fact an adaptation of H. G. Well's novel, 'The War of the worlds' (1898), which appeared realistic, also because it ran without commercial breaks. This demonstrates how even in simple but creative form of narrative media can be powerful enough to create the illusion provided by the contents of the story. But as our exposure to such media and contents increased, our threshold of media experience definitely improved as well.

As in the near future we gradually move into the realm of Aesthetiography, with extreme possibilities of strong perceptual illusions, the above mentioned implications call for appropriate guidelines and regulations regarding the strength of Evoked Reality one may experience. As in the case of any new media, it is a natural step that is bound to evolve simultaneously. But the more imperative question would be how close Aesthetiographic media will get to a Simulated Reality scenario. How would Aesthetiography evolve in order to recreate a perfect perceptual experience? Will it be by the extension of virtual reality techniques affecting primarily our external perception? Or will it be through direct mediation of our neural network? In that case will we be able to perfectly experience (whether in real-time or not) another person's perceptual experience from his perspective? And most importantly, will a perfect perceptual illusion of a reality induce a perfect psychological illusion as well, making one's mind lose awareness of the Primary Reality itself, forming a perfect mediated psychosis or a perfect Simulated Reality?

6. CONCLUSION

In this paper we discussed Evoked Reality (the spatio-temporal 'illusion of reality') and Evoked Presence (the 'sense of presence') induced in our mind (Pillai et al., 2013), especially by representational media. We examined the concept of Media-Evoked Reality and thus how media evolved over the ages. We established that the desire for physical transcendence and of escaping into another reality has always been a principle driving force in the evolution of media, particularly in terms of experience sharing. We observed how art and technology always evolved simultaneously, inspiring and complimenting each other. We suggested that the evolution of media has always been looking forward to an ultimate form of representation of reality that one could experience - a perfect Simulated Reality. Media technologies have been constantly improving in order to achieve stronger perceptual and psychological illusions. To this point, it is through virtual reality and associated technologies that we can create the strongest Evoked Reality possible; which is clearly observable from the exceptional reactions and behaviour of users in virtual environments. With respect to these developments, the distinct goal of tomorrow's media would be to create a perfect experience of perceptual illusion with the help of multisensory mediation. We believe that in this quest for an ultimate representational media, different media technologies will converge. This meeting point of cinema, virtual reality and associated higher level new-media technologies in the near future, is what we would like to call 'Aesthetiography' - the art and science of capturing (or creating) and reproducing an absolute perceptual experience. We propose that Aesthetiography will soon convey its impact on the evolution of media and will therefore be the next milestone in the confluence of new-media technologies.

REFERENCES

- Astrinaki, E. (2012). Enhancing Presence: Sensory Integration and Proprioception in Cinema. *American Society for Aesthetics Graduate E-journal* 4.
- Bailenson, J.N., Yee, N., Merget, D., and Schroeder, R. (2006). The effect of behavioral realism and form realism of real-time avatar faces on verbal disclosure, nonverbal disclosure, emotion recognition, and copresence in dyadic interaction. *Presence: Teleoperators and Virtual Environments* 15, 359-372.
- Biocca, F. (1997). "The cyborg's dilemma: Embodiment in virtual environments", in: *Cognitive Technology, 1997. 'Humanizing the Information Age'. Proceedings., Second International Conference on.* IEEE, 12-26.
- Biocca, F. (2002). "The Evolution of Narrative Media: " Being There" in Non-linear Narrative Worlds," in *Narrative Impact: Social and Cognitive Foundations*, eds. M.C. Green, J.J. Strange & T.C. Brock. 97-130.
- Biocca, F. (2003). "Can we resolve the book, the physical reality, and the dream state problems? From the two-pole to a three-pole model of shifts in presence", in: *EU Future and Emerging Technologies, Presence Initiative Meeting*. Venice, Italy.
- Biocca, F., Inque, Y., Polinsky, H., Lee, A., and Tang, A. (2002). Visual cues and virtual touch: Role of visual stimuli and intersensory integration in cross-modal haptic illusions and the sense of presence. *Proceedings of Presence*, 410-428.
- Biocca, F., Kim, T., and Levy, M. (1995). "The vision of virtual reality," in *Communication in the age of virtual reality*, eds. F. Biocca & M.R. Levy. Hillsdale, NJ: Lawrence Erlbaum Associates, 3-14.
- Biocca, F., and Levy, M.R. (1995). "Communication in the age of virtual reality." Hillsdale, NJ: Lawrence Erlbaum Associates.
- Bishop, I.D. (1994). The role of visual realism in communicating and understanding spatial change and process. *Visualization in Geographical Information Systems*, 60-64.
- Blascovich, J., and Bailenson, J. (2011). *Infinite Reality: Avatars, Eternal Life, New Worlds, and the Dawn of the Virtual Revolution*. Harper Collins.
- Blascovich, J., Loomis, J., Beall, A.C., Swinith, K.R., Hoyt, C.L., and Bailenson, J.N. (2002). Immersive virtual environment technology as a methodological tool for social psychology. *Psychological Inquiry* 13, 103-124.
- Bostrom, N. (2003). Are you living in a computer simulation? *Philosophical Quarterly* 53, 243-255.
- Bruder, G., Steinicke, F., Rothaus, K., and Hinrichs, K. (2009). "Enhancing presence in head-mounted display environments by visual body feedback using head-mounted cameras", in: *CyberWorlds, 2009. CW'09. International Conference on.* IEEE, 43-50.
- Christou, C., and Parker, A. (1995). Visual realism and virtual reality: a psychological perspective. *Simulated and virtual realities: elements of perception*, 53-84.
- Cruz-Neira, C., Sandin, D.J., and Defanti, T.A. (1993). "Surround-screen projection-based virtual reality: the design and implementation of the CAVE," in *Proceedings of the 20th annual conference on Computer graphics and interactive techniques.*: ACM, 135-142.
- Draper, J.V., Kaber, D.B., and Usher, J.M. (1998). Telepresence. *Human Factors: The Journal of the Human Factors and Ergonomics Society* 40, 354-375.
- Freeman, J., and Avons, S.E. (2000). "Focus group exploration of presence through advanced broadcast services", in: *Electronic Imaging*. International Society for Optics and Photonics, 530-539.
- Gerrig, R.J. (1993). *Experiencing narrative worlds: On the psychological activities of reading*. Yale University Press.
- Geslin, E., Bouchard, S., and Richir, S. (2011). Gamers' versus non-gamers' emotional response in virtual reality. *Journal of CyberTherapy & Rehabilitation* 4, 489-493.
- Grau, O. (2004). *Virtual Art: from illusion to immersion*. MIT Press.
- Hamit, F. (1993). "Virtual reality and the exploration of cyberspace." Carmel, Indiana: Sams, 57.
- Hatada, T., and Sakata, H. (1980). Psychophysical analysis of the "sensation of reality" induced by a visual wide-field display. *SMPTE Journal* 89, 560-569.
- Heilig, M.L. (1962). "Sensorama simulator". U.S. Patent # 3050870).
- Heilig, M.L. (1998). "Beginnings: Sensorama and the Telesphere Mask", in: *Digital illusion*. New York, ACM Press, 343-351.
- Hendrix, C., and Barfield, W. (1996). Presence within virtual environments as a function of visual display parameters. *Presence: Teleoperators and virtual environments* 5, 274-289.

- Ijsselstein, W.A. (2003). "Presence in the Past: what can we learn from Media History?", in: *Being There: Concepts, effects and measurement of user presence in synthetic environments*. (eds.) G. Riva, F. Davide & W.A. Ijsselstein. (Amsterdam, The Netherlands: Ios Press).
- Ijsselstein, W.A., De Ridder, H., Freeman, J., and Avons, S.E. (2000). "Presence: concept, determinants, and measurement", in: *Electronic Imaging*. International Society for Optics and Photonics, 520-529.
- Ispr - International Society for Presence Research. (2000). The Concept of Presence: Explication Statement. Available: <http://ispr.info/about-presence-2/about-presence/> [Accessed 2012].
- Johnsen, E.G., and Corliss, W.R. (1971). *Human factors applications in teleoperator design and operation*. Wiley-Interscience.
- Kim, T. (1996). Effects of presence on memory and persuasion. *University of North Carolina, Chapel Hill, NC*.
- Kim, T., and Biocca, F. (1997). Telepresence via Television: Two Dimensions of Telepresence May Have Different Connections to Memory and Persuasion. *Journal of Computer-Mediated Communication* 3, 0-0.
- Kozinski, J. (1970). *Being There*. New York: Harcourt Brace Jovanovich.
- Krueger, M.W. (1985). VIDEOPLACE: A Report from the Artificial Reality Laboratory. *Leonardo* 18, 145-151.
- Lessiter, J., Freeman, J., Keogh, E., and Davidoff, J. (2001). A cross-media presence questionnaire: The ITC-Sense of Presence Inventory. *Presence: Teleoperators & Virtual Environments* 10, 282-297.
- Llobera, J., Spanlang, B., Ruffini, G., and Slater, M. (2010). Proxemics with Multiple Dynamic Characters in an Immersive Virtual Environment. *ACM Transactions on Applied Perception*.
- Lombard, M., and Ditton, T. (1997). At the Heart of It All: The Concept of Presence *Journal of Computer-Mediated Communication* [Online], 3. Available: <http://jcmc.indiana.edu/vol3/issue2/lombard.html>.
- Loomis, J.M. (1992). Distal attribution and presence. *Presence: Teleoperators and virtual environments* 1, 113-119.
- Loomis, J.M., Blascovich, J.J., and Beall, A.C. (1999). Immersive virtual environment technology as a basic research tool in psychology. *Behavior Research Methods* 31, 557-564.
- Mantovani, G., and Riva, G. (1999). "Real" presence: how different ontologies generate different criteria for presence, telepresence, and virtual presence. *PRESENCE* 8, 540-550.
- Milgram, P., Takemura, H., Utsumi, A., and Kishino, F. (1994). Augmented Reality: A class of displays on the reality-virtuality continuum. *Telemanipulator and Telepresence Technologies* 2351, 282-290.
- Minsky, M. (1980). Telepresence. *Omni* 2, 45-52.
- Pillai, J.S. (2013). *Evoked Reality: From Dreams to Simulations - A conceptual framework of Reality referring to Presence*. [Doctoral Thesis], Angers: Arts et Métiers ParisTech.
- Pillai, J.S., Schmidt, C.T.A., and Richir, S. (2013). Achieving Presence through Evoked Reality. *Frontiers in Psychology (Frontiers in Consciousness Research)* 4.
- Putnam, H. (1982). "Brains in a Vat," in *Reason, Truth, and History*. Cambridge University Press, 1-21.
- Ravaja, N., Saari, T., Turpeinen, M., Laarni, J., Salminen, M., and Kivikangas, M. (2006). Spatial presence and emotions during video game playing: does it matter with whom you play? *Presence: Teleoperators and Virtual Environments* 15, 381-392.
- Reeves, B. (1991). Being there: Television as symbolic versus natural experience. *Unpublished manuscript, Institute for Communication Research, Stanford University, Stanford, CA*.
- Richir, S., Le Marc, C., Pallot, M., Schmidt, C., and Mathieu, J.P. (2011). "Serious Gaming and Virtual Reality Technologies to Enhance Learning and Collaboration in Education", in: *International Conference on Education (ICE 2011)*. Samos Island, Greece, 513-519.
- Slater, M. (2009). Place Illusion and Plausibility Illusion can lead to realistic behaviour in immersive virtual environments. *Philosophical Transactions of the Royal Society B: Biological Sciences* 364, 3549-3557.
- Slater, M., Khanna, P., Mortensen, J., and Yu, I. (2009). Visual realism enhances realistic response in an immersive virtual environment. *IEEE Computer Graphics and Applications* 29, 76-84.
- Slater, M., and Usoh, M. (1993). Representations systems, perceptual position, and presence in immersive virtual environments. *Presence: Teleoperators and virtual environments* 2, 221-233.
- Steuer, J. (1992). Defining virtual reality: Dimensions determining telepresence. *Journal of communication* 42, 73-93.
- Steuer, J. (1995). "Defining virtual reality: Dimensions Determining Telepresence," in *Communication in the age of virtual reality*, eds. F. Biocca & M.R. Levy. Hillsdale, NJ: Lawrence Erlbaum, 33-566.
- Steuer, J. (2006). Defining virtual reality: Dimensions determining telepresence. *Journal of communication* 42, 73-93.

- Sutherland, I.E. (1965). The ultimate display. *Multimedia: From Wagner to virtual reality*.
- Telepresence.Org. (2006). Sensorama by Morton Heilig. Available: <http://www.telepresence.org> [Accessed 29 Nov. 2011].
- Usoh, M., Arthur, K., Whitton, M.C., Bastos, R., Steed, A., Slater, M., and Brooks Jr, F.P. (1999). "Walking> walking-in-place> flying, in virtual environments", in: *International Conference on Computer Graphics and Interactive Techniques: Proceedings of the 26 th annual conference on Computer graphics and interactive techniques*. 359-364.
- Vinayagamoorthy, V., Brogni, A., Gillies, M., Slater, M., and Steed, A. (2004). "An investigation of presence response across variations in visual realism", in: *Presence 2004: The 7th Annual International Workshop on Presence*. 148-155.
- Waterworth, J.A., and Waterworth, E.L. (2006). "Presence as a Dimension of Communication: Context of Use and the Person", in: *Form Communication to Presence: Cognition, Emotion and Culture Towards the Ultimate Communicative Experience. Festschrift in honor of Luigi Anolli*, ed. M.T.A. G. Riva, B.K. Wiederhold and F. Mantovani. Amsterdam, Netherland IOS Press, 81-96.

Relevant tracks in SPT 2013:

- 4. ICTs 4: new media, public space and democracy
- 7. Informatics, nano- and bio-technological convergences
- 9. Information and aesthetics